

Application No. 10/750,468
Response dated 12/19/2006 responding to Office Action dated 11/03/2006

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AMENDMENTS

In the Claims

Please amend claims 10 and 12 as follows. The following listing of claims will replace all prior versions and listings of claims in the application.

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LISTING OF THE CLAIMS

1. (Original) An audio speaker comprising:

a motor assembly including,

a magnet,

a first magnetically conductive member magnetically coupled to the magnet, the first magnetically conductive member comprising a plurality of laminated layer sections which are magnetically coupled to but electrically insulated from each other, and

a second magnetically conductive member magnetically coupled to the magnet,

a magnetic air gap between the first and second magnetically conductive

members; and

a diaphragm assembly coupled to the motor assembly and including a voice coil disposed within the magnetic air gap.

2. (Original) The audio speaker of claim 1 wherein:

each of the laminated layer sections has a substantially uniform thickness.

3. (Original) The audio speaker of claim 1 wherein:

the laminated layer sections are not all of the same thickness.

4. (Original) The audio speaker of claim 1 wherein:

each of the laminated layer sections has a substantially wedge shape.

5. (Original) An audio speaker comprising:

a diaphragm assembly including a voice coil; and

a motor assembly including,

a first magnetically conductive member,

a first laminated structure in which a plurality of magnetically conductive sections are mechanically coupled together and electrically insulated from each other to prevent eddy currents which would otherwise be induced by an electrical current applied to the voice coil, and

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a magnet magnetically coupled between the first magnetically conductive member and the laminated structure,
wherein the first magnetically conductive member and the laminated structure define between them a magnetic air gap within which the voice coil is disposed.

6. (Original) The audio speaker of claim 5 wherein:
the first laminated structure comprises a top plate.

7. (Original) The audio speaker of claim 5 wherein:
the first laminated structure comprises a pole yoke.

8. (Original) The audio speaker of claim 5 wherein:
the first laminated structure comprises a cup yoke.

9. (Original) The audio speaker of claim 5 wherein:
the first laminated structure comprises a tube yoke.

10. (Presently Amended) An improvement in a electromagnetic motor structure which includes a magnetically conductive yoke, a magnetically conductive top plate defining a magnetic air gap with the yoke, and a permanent magnet magnetically coupled between the yoke and the top plate, wherein the improvement comprises:
at least one of the yoke and the top plate being comprised of multiple components laminated together so as to be electrically insulated from each other;
whereby the at least one of the yoke and the top plate which is laminated has a significantly reduced susceptibility to eddy currents being induced therein by a varying magnetic flux field from a voice coil in the magnetic air gap.

11. (Original) The improvement in the electromagnetic motor structure of claim 10, wherein the improvement further comprises:
the multiple laminated components each having one of a substantially flat shape and a substantially wedge shape.

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1 12. (Presently Amended) The improvement in the electromagnetic motor structure of claim
2 10, wherein the improvement further comprises:
3 both the yoke and the top plate being so laminated.

1 13. (Original) The improvement in the electromagnetic motor structure of claim 10, wherein the
2 improvement further comprises:
3 the yoke comprising one of a cup, a pole plate, and a tube.

1 14. (Previously Presented) The audio speaker of claim 1 wherein:
2 the magnet comprises an external ring magnet.

1 15. (Previously Presented) The audio speaker of claim 14 wherein:
2 the first magnetically conductive member comprises a top plate.

1 16. (Previously Presented) The audio speaker of claim 14 wherein:
2 the first magnetically conductive member comprises a pole plate.

1 17. (Previously Presented) The audio speaker of claim 16 wherein:
2 the pole plate comprises a laminated pole piece and a monolithic back plate coupled to
3 the laminated pole piece.

1 18. (Previously Presented) The audio speaker of claim 16 wherein:
2 the second magnetically conductive member comprises a top plate which is comprised of
3 a plurality of laminated layer sections which are magnetically coupled to but electrically
4 insulated from each other.

1 19. (Previously Presented) The audio speaker of claim 1 wherein:
2 the magnet comprises an internal magnet.

1 20. (Previously Presented) The audio speaker of claim 19 wherein:
2 the first magnetically conductive member comprises a top plate.

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1 21. (Previously Presented) The audio speaker of claim 20 wherein:
2 the first magnetically conductive member comprises a cup.

1 22. (Previously Presented) The audio speaker of claim 21 wherein:
2 the second magnetically conductive member comprises a top plate which is comprised of
3 a plurality laminated layer sections which are magnetically coupled to but electrically insulated
4 from each other.

1 23. (Previously Presented) The audio speaker of claim 1 wherein:
2 the magnet comprises an internal magnet; and
3 one of the first magnetically conductive member and the second magnetically conductive
4 member comprises a tube yoke.

1 24. (Previously Presented) The audio speaker of claim 23 wherein:
2 the second magnetically conductive member comprises the tube yoke; and
3 the first magnetically conductive member comprises a pole piece.

1 25. (Previously Presented) The audio speaker of claim 23 wherein:
2 the first magnetically conductive member comprises the tube yoke.

1 26. (Previously Presented) The audio speaker of claim 25 wherein:
2 the second magnetically conductive member comprises a pole piece which is comprised
3 of a plurality of laminated layer sections which are magnetically coupled to but electrically
4 insulated from each other.

1 27. (Previously Presented) The audio speaker of claim 25 wherein the tube yoke comprises:
2 a plurality of substantially rectangular laminate layer sections coupled together.

1 28. (Previously Presented) The audio speaker of claim 27 wherein:
2 at least some of the substantially rectangular layer sections include holes through which a
3 bolt may be passed from one layer section to a next layer section along an axis of the tube.

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1 29. (Previously Presented) The audio speaker of claim 28 wherein:
2 the holes are formed through tabs extending from a main body of the layer section.

1 30. (Previously Presented) The audio speaker of claim 25 wherein:
2 the tube comprises a plurality of substantially V-shaped laminate layer sections coupled
3 together; and
4 the top plate comprises a plurality of laminate layer sections coupled together .

1 31. (Previously Presented) The audio speaker of claim 30 wherein the plurality of laminate
2 layer sections of the top plate comprises:
3 a plurality of one-piece top plate sections; and
4 a plurality of two-piece top plate sections.

1 32. (Previously Presented) The audio speaker of claim 31 wherein:
2 the one-piece top plate sections and the two-piece top plate sections include
3 corresponding holes through each, extending along an axis of the tube.

1 33. (Previously Presented) The audio speaker of claim 23 further comprising:
2 an external magnet magnetically coupled to the tube; and
3 an external top plate magnetically coupled to the external magnet.

1 34. (Previously Presented) The audio speaker of claim 33 wherein:
2 the external top plate comprises a plurality of laminated layer sections which are
3 magnetically conductive but electrically insulated from each other.

1 35. (Previously Presented) The audio speaker of claim 23 further comprising:
2 a collar magnetically coupled to the tube and defining the magnetic air gap with the pole
3 piece.

1 36. (Previously Presented) The audio speaker of claim 23 wherein the tube comprises:
2 shoulders adjacent the diaphragm assembly.

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1 37. (Previously Presented) The audio speaker of claim 1 wherein the second magnetically
2 conductive member comprises a plurality of laminated layer sections which are magnetically
3 coupled to but electrically insulated from each other.

1 38. (Previously Presented) The audio speaker of claim 37 wherein:
2 the laminated layer sections of the first magnetically conductive member are oriented in a
3 different direction than the laminated layer sections of the second magnetically conductive
4 member.

1 39. (Previously Presented) The audio speaker of claim 5 wherein:
2 the first magnetically conductive member comprises a second laminated structure in
3 which a plurality of magnetically conductive sections are mechanically coupled together and
4 electrically insulated from each other to prevent eddy currents which would otherwise be
5 induced by the electrical current applied to the voice coil.

1 40. (Previously Presented) The audio speaker of claim 39 wherein:
2 the magnetically conductive sections of the first laminated structure have a different
3 orientation than the magnetically conductive sections of the second laminated structure.

1 **41.** (Previously Presented) A method of operating an audio speaker to move a diaphragm in
2 response to an alternating current electrical signal applied to the speaker, the method comprising:

3 (A) conducting magnetic flux from a magnet, thence through a first magnetically
4 conductive member, over a magnetic air gap, thence through a second magnetically conductive
5 member, and thence back to the magnet,

6 (B) conducting the electrical signal through a voice coil which is disposed within the
7 magnetic air gap and wound around a bobbin which is coupled to the diaphragm;

8 (C) in response to the electrical signal being conducted through the voice coil, moving
9 the voice coil under electromotive force in response to the presence of the magnetic flux across
10 the magnetic air gap; and

11 (D) substantially preventing eddy current in at least one of the first and second
12 magnetically conductive members, by virtue of the at least one of the first and second

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13 magnetically conductive members comprising a laminated structure of electrically insulated
14 magnetically conductive sections, which eddy current would otherwise be induced by the
15 electrical signal being conducted through the voice coil.

1 42. (Previously Presented) The method of claim 41 further comprising:
2 holding the laminated structure together with at least one bolt passed through
3 corresponding holes which extend through the respective electrically insulated magnetically
4 conductive sections.